menon the appearance of a luminous and gigantic dahlia, the centre of which was occupied by the black disc of the moon.

The corona did not present any essential differences of structure at the point of contact and the opposite point. The motion of the moon did not appear to produce any change in the structure. These facts completely convinced me that the corona is a real object, situated beyond the moon, the gradual motion of which body reveals its various parts. Having finished this investigation, I turned my attention to the luminous elements of the phenomenon. My view being yet as distinct as ever, I commenced by examining the spectrum of the highest and least luminous parts of the corona. I placed the slit of the spectroscope at a point two-thirds of a radius from the moon's limb (*environ du bord lunaire*). The spectrum was seen much more vividly than I expected at that distance, a result evidently due to the luminous powers of the telescope and to the whole of the arrangements adopted. This spectrum was not continuous. I recognised at once the hydrogen lines and the green ray (1474).*

This is one point of the highest importance; I removed the slit, remaining always in the high regions of the corona; the spectra always presented the same constitution.

Starting from one of these positions, I descended little by little towards the chromosphere, examining very carefully the changes which might be produced. In proportion as I approached the moon, the spectra became more distinct and appeared richer, but they remained similar to the above in general constitution. In the middle heights of the corona, from 3′ to 6′ of arc, the dark line D was seen, as well as some obscure lines in the green; but these are at the limit of visibility. This observation proves the presence in the corona of reflected solar light, but it is seen that this light is drowned in an abundant extraneous (*étrangère*) luminous emission.

I then set myself to a very important observation, which I expected would give me the spectral relations between the corona and the protuberances. The slit was adjusted so as to take in a portion of the moon, a protuberance, and all the height of the corona. The spectrum of the moon was excessively pale; it appears due principally to atmospheric illumination, and gives a valuable idea of the feeble part which our atmosphere can play in the phenomenon of the corona.

The protuberance gave a very rich spectrum and one of great intensity; I had not time to make a detailed examination. The main point here is the establishment of the fact of the prolongation of the principal rays of the protuberance through all the height of the corona, which clearly demonstrates the existence of hydrogen in the latter.

The green line (1474), so vivid in the spectrum of the corona, appeared interrupted in the spectrum of the protuberance—a very remarkable result. I then gave a few moments to establish satisfactorily the exact correspondence of the lines of the corona with the principal lines of hydrogen in the protuberances.

There remained to me then only a few seconds for polariscopic observation.† The corona presented the characteristics of radial polarisation, and, it ought to be remarked, the maximum of effect is not observed at the lunar limb, but at some minutes from the edge.‡

I had scarcely finished this rapid investigation when the sun reappeared.

JANSSEN

(To be continued.)

NOTES

THE subject of the Transit of Venus in 1874 was for the first time officially brought before the notice of the Board of Visitors at the recent Visitation of the Royal Observatory. After a careful exposition of the matter by the Astronomer Royal, and a consideration thereof by the Visitors, it was proposed and seconded by the Astronomical Professors of Cambridge and Oxford, that the Government be requested to provide the means of organising some parties of observers in the Southern Ocean, in the hope that they may find some additional localities for observing the whole duration of the Transit of Venus. In other language, they recommend strongly a sort of *roving* expedition. The meteorological and climatic difficulties both North and South are extremely great: the practical difficulties in the South are very peculiarly so; in despite of the latter, the Board of Visitors were unanimous in their advice to try what best can be done in the sub-antarctic regions. The Astronomer Royal expressed his perfect acquiescence in the proposal of the Visitors; the final decision will rest with the Admiralty and the Government. In coming to this decision, it is proper to add that the Board was in no degree either influenced or assisted by certain discussions which have taken place upon the subject out of doors; their decision would have been just the same whether these discussions had or had not taken place; and the Board came to their conclusion under a full knowledge of the very peculiar climatic and navigational difficulties which seem to attend on the roving expedition which they recommend. It is, in fact, only a realisation of an old proposal by the Astronomer Royal himself, which seems to have been set aside on account of the many serious practical difficulties attending it. The Astronomer Royal also proposed to organise some additional stations dependent on Honolulu.

MESSRS. SAMPSON LOW AND MARSTON are about to publish a volume on the subject of Arctic Exploration, by Mr. Clements Markham, entitled the "Threshold of the Unknown Region." It is intended to give a full account of all that is known of the line which, at present, separates the known from the unknown; to explain the best route by which the unexplored region may be examined; and to enumerate the important scientific results to be derived from Arctic exploration.

NATURALISTS will be glad to hear that the long-talked-of new buildings for the National Museum of Natural History, at South Kensington, have been actually commenced, and that the contractors, Messrs. Baker, have arranged to complete them within three years.

MR. F. T. WARNER, of Winchester, who for some time has been collecting materials for a Flora of Hampshire, has kindly offered the use of his collections and materials to Mr. Frederick Townsend with the proposal that he should complete the Flora. Mr. Townsend has accepted the offer, and as much work remains to be done, he invites the assistance of other botanists in furnishing him with lists of plants or in forming these during the present season. The value of lists will be greatly increased if accompanied by specimens, and in all cases exact localities and dates should be given. It is proposed to divide the country into river-basin districts. Letters should be addressed to Shedfield Lodge, Fareham, but parcels to Botley Station, London and South Western Railway. Mr. Townsend will gladly pay postage or carriage of parcels.

PROFESSOR ROLLESTON, of Oxford, is appointed to deliver the Harveian Oration at the Royal College of Physicians on June 25, at five o'clock.

IT is rumoured that Prof. Tyndall is to receive the honorary degree of D.C.L. from the University of Oxford during the ensuing Commemoration.

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* My spectroscope was fitted with a very exact scale; but it will be seen how I afterwards made use of the lines of a protuberance as a scale.

† To study polarisation, I have an excellent telescope excellently constructed of biquartz, by M. Prazmowski. This polariscope, placed upon and adjusted to the telescope, can be consulted in an instant.

‡ M. Prazmowski has noted this fact in his excellent polariscopic observations of the eclipse of July 17, 1860.

THERE will be an election at Magdalen College, Oxford, in October next, to not less than six Demyships and one Exhibition. Of the Demyships, one at least will be mathematical, one at least in Natural Science, and the rest classical. The Exhibition will be in Natural Science. The stipend of the Demyships is 95*l.* per annum, and of the Exhibition 75*l.*, inclusive of all allowances; and they are tenable for five years, provided that the holder does not accept any appointment which in the judgment of the electors will interfere with the completion of his University studies. The examination for the Mathematical and Natural Science Demyships will be held in common with Merton College, at the same time and with the same papers. Each candidate will be considered as standing in the first place at the College at which he has put down his name, and, unless he shall give notice to the contrary, will be regarded as standing at the other College also. In conducting the Examination for Magdalen College Demyships in Natural Science, questions will be put relating to General Physics, to Chemistry, and to Biology, including Human and Comparative Anatomy and Physiology, with the principles of the classification and distribution of Plants and Animals; but a clear and exact knowledge of the principles of any one of the above-mentioned Sciences will be preferred to a more general and less accurate acquaintance with more than one. The Examination in Biology and Chemistry will be partly practical, if necessary. Candidates for Demyships in Natural Science and Mathematics have also to satisfy the Electors of their ability to pass the ordinary Classical Examinations required by the University. Very superior excellence, however, in Natural Science or Mathematics will be allowed to compensate for any deficiency which Candidates may show in the Classical part of the Examination, provided that the Candidate, if elected, undertake to make up this deficiency at a subsequent period. The next Examination will commence on Tuesday, October 7, at 9 A.M. Particulars relating to the examinations in the various subjects may be obtained by applying to the senior tutor.

THERE will be an election at Merton College, Oxford, in October next, to three Postmasterships, value 80*l.* per annum, tenable for five years, or so long as the holder does not accept any appointment incompatible with the full pursuance of his University studies. One of these Postmasterships will be awarded for proficiency in Mathematics, two for proficiency in Physical Science. In the examination for the Mathematical Postmastership, papers will be set in Algebra, Pure Geometry, Trigonometry, Theory of Equations, and Analytical Geometry of two dimensions. Candidates for this Postmastership must not have exceeded four terms of University standing. There is no limit of age. In the examination for the Physical Science Postmasterships, papers will be set in Chemistry, Physics, and Biology; and an opportunity will be given of showing a knowledge of practical work in Chemistry and Biology. The Postmasterships will be given either for special excellence in one subject, or for excellence in two of the three subjects; but no candidate will be examined in more than two subjects. A paper will be set in Elementary Algebra and Geometry, which, *cæteris paribus*, will be of weight in the election to the Postmasterships. Candidates for these Postmasterships must not have exceeded six Terms of University standing. There is no limit of age. The examination will commence on Tuesday, October 7, at 9 A.M., in Merton College Hall. Candidates are required to call on the Warden on the same day between 4 and 5 P.M. The examination will be held in common with Magdalen College at the same time, and with the same papers. Each candidate will be considered as standing, in the first instance, at the College at which he has put down his name, and, unless he has given notice to the contrary, will be regarded as standing at the other College also.

FROM the report on the progress and condition of the Royal Gardens at Kew during the year 1872, just published by Dr. Hooker, it appears that the number of visitors to the gardens shows an increase of 6,000 over that in 1871, very nearly half the number being Sunday visitors. Considerable additions and improvements have been made during the year in various parts of the gardens; the Pinetum now numbers about 1,200 species of coniferous plants, including almost every species that can be grown out of doors in this climate. Seeds and living plants have been received from various parts of the world, and a large number of parcels sent off to our colonies and elsewhere. The acquisitions to the Museums have been considerable, and those to the Herbarium quite exceptional in magnitude and importance, including an extremely valuable presentation by the Rev. C. New of plants collected on the Alpine zone of Kilima-njaro, the only hitherto visited snow-clad mountain in Equatorial Africa; 2,000 Brazilian plants from M. Glaziou, Director of the Botanic Gardens at Rio de Janeiro; and a beautiful collection of Appalachian mosses from Prof. Asa Gray of Cambridge, U.S. Among the publications issued during the last year either officially or by private botanists working at Kew, are the commencement of the second volume of Bentham and Hooker's "Genera Plantarum," the sixth volume of the "Flora Australiensis," by Mr. Bentham; the first part of the "Flora of British India," by Dr. Hooker; several parts of Martius's "Flora Brasiliensis;" Col. Grant's account of the plants collected by Capt. Speke and himself in Central Africa, &c.

SPECIAL certificates of proficiency have been taken at the recent examination for women of the University of London in the following scientific branches:—in Mathematics, by Miss Black and Miss Orme; in Chemistry and Natural Philosophy, by Miss Eaton and Miss Wood; in Human Physiology, by Miss Kilgour of the Ladies' College, Cheltenham, the first time this branch has been taken by a lady; and in Political Economy by Miss Lord and Miss Orme.

MR. GWYN JEFFREYS is about to join the *Challenger* at Madeira for a cruise to the Canaries, Cape de Verde Islands, and Bahia.

M. P. J. VAN BENEDEN describes, in the Bulletin of the Belgian Academy of Sciences, a fossil bird found in the Rupelian clay of Waes, in all respects similar to the existing *Anas Marila*.

LAST Saturday appeared the first number of a new French scientific periodical named *La Nature*. The articles are all popular, and the illustrations are plentiful and well executed.

DR. LEONE LEVI, the Consul-General for Paraguay, is arranging a scientific commission to inquire into the resources of Paraguay. The commission is to consist of botanical, agricultural, geological, mineralogical, and geographical surveyors. It is understood that the Consul-General has in view to appoint a French botanist, of great reputation, and a Scotch agriculturist, but has made no arrangement for the geologist and geographer. Dr. Levi would be glad to give information to anybody who might be willing to offer his co-operation in such a scientific expedition.

LETTERS from Sydney announce the arrival there of the Italian frigate, *Vettore Pisani*, with the naturalist D'Albertis on board, he having been forced to leave New Guinea by repeated attacks of fever. His companion, Odoardo Beccari, well known for the valuable collections he made between 1865 and 1868 in Borneo, and subsequently in N.E. Africa, and which are now in the civic museum of Genoa, has remained in New Guinea. Signor D'Albertis is coming overland to London, and will bring with him a large collection of Zoological specimens.

THE second of the two parts of Prof. C. J. Sundevall's new Synopsis of the Classification of Birds has just reached us from Stockholm. This important contribution to ornithological literature, the work of so justly celebrated and painstaking an ornithologist, will be found replete with suggestions, as its author bases his methods of arrangement on details worked out mostly by himself, and with a truly scientific spirit. Some of the arrangements suggested are particularly striking, and though they will probably not all bear the test of future inquiry, yet are undoubtedly based on characters, the importance of which has been too little attended to. Among these peculiarities may be mentioned the placing of the Hoopoo with the Larks, quite away from *Irrisor;* and the adoption of Strickland's eccentric idea that the Pratincole is only a modified Nightjar; to say the least, would it not be more reasonable to call the Nightjar a modified Plover?

THE correspondent of the *New York Herald* at Khartoum writes to that journal as follows, under date of April 30:—Three boats engaged in the ivory trade arrived from Gondokoro, April 7, with direct news that Sir Samuel Baker and family were well at Fatuka in the month of February. The reinforcement of 200 men which went forward from Gondokoro reached Baker, at Fatuka, February 5. It was said that with these troops Baker would renew his march towards the Albert Nyanza and the territory of Kaberego (formerly Kamrasi). We are hourly expecting the arrival of a fleet of nineteen Government vessels with mails, which will doubtless bring full particulars of Baker's recent movements.

IN No. 145 of the *Gazzetta Ufficiale del Regno d'Italia*, Prof. Lorenzo Respighi, director of the observatory at Campidoglio, gives an account of his observations of the eclipse of May 26. He states that though the maximum phase was so small as to be of little importance, he considered it a good opportunity for making spectroscopic time observations. The method is very simple, and is well known to spectroscopists; it need only be said that it consists in observing accurately the moment at which the dark body of the moon cuts out one of the chromospheric bright lines. Prof. Respighi observed the C-line and was able to perceive the moon's approach across the chromosphere about one minute before first contact, which took place at 46°·30′ from north towards the west point of the sun at 8h. 42m. 35·9s. Roman mean time. The greatest phase occurred at 9h. 7m. when 0·05 of the sun's diameter was covered. The last contact was observed at 10° from the north towards west at 9h. 31m. 3·4s. Roman mean time. The dark moon was seen passing over the chromosphere for about a minute after last contact. The Sicilian expedition had before noticed the power which the spectroscope gave of observing the first and last moments of contact before the times given in the Nautical Almanac, and there can be no doubt that this method is of very great value for time observations of eclipses and transits. Unfortunately in the latter cases it is almost or quite impossible to keep the slit at the exact point at which the body is expected to enter the solar disc on account of the difficulty in obtaining perfect adjustments of the driving clock, &c. It might however be possible to follow the body in transit across the sun and note the exact time of last contact.

WE have received the fifteenth report of the East Kent Natural History Society, containing reports of the scientific meetings for the year 1872, and various statistical reports. The society has probably never been in a more prosperous condition as to funds and members, the number of the latter being reported as 109, and the reports of the meetings show that the society is in good working trim. Prefixed is a brief but pointed address by the President, Dr. Mitchinson, in which he points out the utility and some of the dangers of Provincial Natural History Societies. He refers to one evil which is apt to result from the labours of such societies, an evil which has with justice been animadverted on from various quarters recently, viz. a morbid mania for indiscriminate collecting, which is apt to lead to the extinction of the rarer fauna and flora of a district. No doubt, as Dr. Mitchinson says, collecting is inseparable from the thorough study of botany and zoology; but, as he forcibly remarks, no surer sign exists of a spurious pursuit of either or both of these sciences than when rare plants are torn up, and rare animals made still rarer by that selfish acquisitiveness which passes with so many for a love of science. It is the duty of every Natural History Society to discourage such a practice.

THE discovery of another planet, No. 131, is telegraphed from America.

IT has been resolved by the United States' Government to hold an investigation into the circumstances connected with the loss of the Arctic exploring ship *Polaris* and the death of her commander, Captain Hall.

THE publication of the West Kent Natural History, Microscopical, and Photographic Society, is mainly occupied by two valuable and extremely interesting addresses by the president, Mr. J. Jenner Weir, F.L.S. The first was delivered at the annual meeting in February last, and consists chiefly of some careful observations and facts illustrating the doctrine of evolution in the animal kingdom. His other address was delivered at a *soirée* held at the Crystal Palace, its subject being "The Aquarium and its Contents," Mr. Weir noticing some of the most remarkable facts connected with the organisation and habits of the different classes of animals in the aquarium. We are glad to see from the Council's report that the Society continues prosperous and efficient.

ADDITIONS to the Brighton Aquarium during the past week:—One Sturgeon (*Accipenser sturio*), from Rye Bay; Smooth Hounds, or Skate-toothed Sharks (*Mustelus vulgaris*); Toper, or White Hound (*Galeus canis*); Gurnards (*Trigla lyra et lineata*); Lesser Weevers (*Trachinus vipera*); Scald Fish (*Arnoglossus laterna*); Sea Trout (*Salmo trutta*); Surmullet (*Mullus surmuletus*); Conger Eels (*Conger vulgaris*); Octopus (*Octopus vulgaris*); Lobsters (*Homarus vulgaris*); Sea Crayfish (*Palinurus vulgaris*); Sea Cucumbers (*Cucumaria pentactes*); Zoophytes (*Alcyonium digitatum, Tubularia indivisa, Pleurobranchia pileus*).

THE additions to the Zoological Society's Gardens during the past week include a Grey Ichneumon (*Herpestes griseus*) from India, presented by Mrs. W. Simpson; an Eyed Lizard (*Lacerta ocellata*) from S. Europe, presented by Mr. T. Blackmore; a Loggerhead Turtle (*Thalassochelys caouana*) from the Atlantic Ocean, presented by Lieut. N. Clark; a Rough-legged Buzzard (*Archibuteo lagopus*) from Europe, presented by Mr. W. Stokes; a Blotched Genet (*Genetta tigrina*) from W. Africa, presented by Mr. A. B. Worthington; two Emus (*Dromæus novæ-hollandiæ*) from Australia, presented by Hon. Sir A. Gordon; a Persian Gazelle (*Gazella subgutturosa*), presented by Captain Phillips; seventeen Turtle Doves (*Turtur auritus*) and a Barbary Turtle Dove (*Turtur risorius*), presented by Mr. Gassiot, Jun.; two Lions (*Felis leo*) from Persia; a Wapati Deer (*Cervus canadensis*) from N. America, purchased; four Trumpeter Swans (*Cygnus buccinator*) and a Purple Kaleege (*Euplocamus horsefieldii*) hatched in the Gardens; four Aldrovandi's Lizards (*Plestiodon auritus*) and two Ocellated Skinks (*Seps ocellatus*) from N.W. Africa, deposited.